



NATURAL GAS METHANE UNITS CONVERTER



English to Metric (SI) Conversion Factors

Unit	mult. → ← div.	Unit
Cubic foot (ft ³)	0.02832	Cubic meter (m ³)
Pound (lb)	0.4536	Kilogram (kg)
Short ton (ton)	0.9072	Metric ton (tonne), (t)
British thermal unit (Btu)	1055	Joule (J)

Natural Gas Methane Conversion Factors

Unit	mult. → ← div.	Unit	Calc. # (see reverse)
Cubic foot (ft ³) CH ₄	0.04246	Pound (lb) CH ₄	
Cubic foot (ft ³) CH ₄	1,014.6*	Btu	
Cubic foot (ft ³) CH ₄	0.2974	Kilowatt-hour _(t) (kWh _(t))	[1]
Cubic foot (ft ³) CH ₄	0.000404	Tonne CO ₂ equivalent	[2]
Cubic foot (ft ³) CH ₄	0.00011	Tonne C equivalent	[3]
Cubic foot (ft ³) CH ₄	19.26	Gram (g)	[4]
Pound (lb) CH ₄	23,896	Btu	
Pound (lb) CH ₄	7	Kilowatt-hour _(t) (kWh _(t))	[5]
Pound (lb) CH ₄	0.00953	Tonne CO ₂ equivalent	[6]
Pound (lb) CH ₄	0.0026	Tonne C equivalent	[7]
Btu	0.000293	Kilowatt-hour _(t) (kWh _(t))	
CH ₄ GWP**	21	CO ₂ GWP	
CO ₂	0.27273	C equivalent	[8]
CH ₄	5.7273	C equivalent	[9]

*Higher heating value (HHV) @ 60° F, 30" Hg, dry.

**GWP = Global warming potential over a 100-year time frame (GWP for carbon dioxide = 1). The value is 18.25 when CH₄ does not displace fossil fuel (e.g., when flared).

Equivalents

Unit	mult. → ← div.	Unit	Calc. # (see reverse)
Households heated/year	70	Million Btu natural gas	
Billion cubic feet (bcf) CH ₄	14,494	Households heated/year	[10]
Billion cubic feet (bcf) CH ₄	121,390	Acres of trees planted	
Billion cubic feet (bcf) CH ₄	89,016	Cars/year that emit equiv. CO ₂	

Convert your methane emissions into a profitable asset.

Calculations

[calc. 1]	1ft ³ CH ₄	=	1,014.6 Btu/ft ³ x 1/3,412 kWh _(t) /Btu = 0.2974 kWh _(t) [^]
[calc. 2]	1ft ³ CH ₄	=	0.04246 lb/ft ³ x 1/2,204.6 lb/tonne x 21 = 0.000404 tonne CO ₂ eq. ^{^^}
[calc. 3]	1ft ³ CH ₄	=	0.000404 tonne CO ₂ eq. x 12/44 C:CO ₂ ratio = 0.00011 tonne C eq. ^{^^}
[calc. 4]	1ft ³ CH ₄	=	0.04246 lb/ft ³ x 0.4536 kg/lb = 19.26 grams
[calc. 5]	1ft ³ CH ₄	=	23,896 Btu x (1/3412) kWh _(t) /Btu = 7.0 kWh _(t)
[calc. 6]	1ft ³ CH ₄	=	(1/2,204.6) tonne/lb x 21 = 0.00953 tonne CO ₂ eq. ^{^^}
[calc. 7]	1ft ³ CH ₄	=	0.00953 tonne CO ₂ eq. x 12/44 C:CO ₂ ratio = 0.0026 tonne C eq. ^{^^}
[calc. 8]	CO ₂	=	12/44 (C:CO ₂ ratio) = C eq.
[calc. 9]	CH ₄	=	21 GWP x 12/44 (C:CO ₂ ratio) = C eq. ^{^^}
[calc. 10]	1bcf CH ₄	=	(1,014.6 x 10 ⁹) Btu x (1/(70 x 10 ⁶)) = 14,494 households/year

[^]kWh_(t) = kilowatt-hours thermal; does not account for efficiency (heat rate).

^{^^}When flaring methane, the net offset is this value multiplied by a factor of (18.25/21).

Nomenclature

m	=	thousand (kilo; k (SI unit); 10 ³)	mcf	=	thousand cubic feet
mm	=	million (mega; M (SI unit); 10 ⁶)	mmcf	=	million cubic feet
b	=	billion (giga; G (SI unit); 10 ⁹)	bcf	=	billion cubic feet

For technical and economic information on reducing methane emissions from natural gas operations, visit the U.S. Environmental Protection Agency's Natural Gas STAR Program Web site at www.epa.gov/gasstar.